



Nutrition and Physical Activities in the Schools: A Qualitative Study of Children Perceptions in Brunei Darussalam

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Authors' contributions

This work was carried out in collaboration among all authors. Author SRA designed and wrote the protocol of the study, collected the data, performed the analysis and wrote the first draft of the manuscript. Authors LS and RB also designed the study, conducted the analysis of the study and write up of the manuscript. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AFSJ/2019/v8i129980

Editor(s):

(1) Dr. Manvesh Kumar Sihag, Mansinhbhai Institute of Dairy and Food Technology, Gujarat, India.

Reviewers:

(1) Arthur N. Chuemere, University of Port Harcourt, Nigeria.

(2) Charles Apprey, Kwame Nkrumah University of Science and Technology, Ghana.

Complete Peer review History: <http://www.sdiarticle3.com/review-history/47977>

Received 22 December 2018

Accepted 16 March 2019

Published 27 March 2019

Original Research Article

ABSTRACT

Aims: The aim of the study was to elicit opinions and attitudes towards healthy eating and physical activity in their schools and barriers towards the activities.

Study Design: Qualitative study.

Place and Duration of Study: Primary school settings in Brunei Darussalam. Duration of the study was January 2012 – January 2013.

Methodology: Five focus groups of primary school students in years 4, 5, and 6 were conducted at 5 selected primary schools in Brunei Darussalam. The focus group session was between 30 minutes and 45 minutes duration and was divided into two separate sections: 'healthy eating' and 'physical activity'. Interviews were transcribed verbatim into a word document and names were removed to ensure confidentiality and anonymity. Thematic analysis was used to analyse the collected data.

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Results: Thematic analysis of the focus group discussions with children produced the following three themes: 'healthy eating and physical activity are important for a healthy and strong body free of disease', 'unhealthy foods make us fat, cause diabetes and are bad for teeth' and 'physical activity mainly related to playing together in groups.'

Conclusion: The children have a good understanding of the detrimental effect of poor diet and inactivity on physical health, but, without a supportive environment, children are faced with a significant barrier in translating their knowledge into action. The students were keen to do more fun activities such as sports activities in the school but were hindered by the availability of time, equipment and safety within the school compound.

Keywords: Nutrition; physical activity; primary school; physical environment; equipment availability; sports facilities.

1. INTRODUCTION

Childhood obesity is increasing very rapidly across the globe [1]. The International Obesity Task Force (IOTF) has reported that about 10% of school-aged children (5 to 17 years old) across the world are found to be overweight, and of that 10%, a quarter of the children is in the obese group [2]. Asian countries, including Brunei, are also going through the childhood obesity in epidemic magnitudes [3]. There has been an increasing trend of childhood obesity among those in primary school years 1, 4, 6 and secondary year 2 from 11.8% in 2005 to 17.3% in 2013 [3]. Obesity is one of the factors that has led to an increased number of deaths from non-communicable diseases (NCDs) in Brunei Darussalam [3]. Without proper intervention policies and programs, childhood obesity issues are likely to persist into adulthood. The consequences of obesity are detrimental to the country's financial situation which increases the budget needs for medical specialists and other hospital services [4,5].

Children are exposed to the school setting during the first two decades of their life, which makes it an ideal place to influence health in general. Schools are the only place in children's life where there is continuous and intensive contact outside the home environment [6]. Attending school is mostly compulsory for all children in many parts of the world. In Brunei, the local Ministry of Education's policy is to provide a minimum of 12 years of education (6 years of primary education and 6 years of secondary education) [7]. Therefore, high participation of the target population and continuous exposures over time made school an ideal setting for health promotion activities, including obesity prevention programs.

Children's eating patterns and habits, including breakfast intake and eating away from home, have a great influence on their health as well as

their performance in school [8]. In recent years, children's eating patterns have received increasing attention from health professionals and researchers. Common dietary issues among children in the United States are the consumption of high levels of fat, sugar and salt, as well as the low intake of fruits and vegetables and calcium-rich foods [9]. Interviews conducted among 75 Singaporean school children aged 7 to 12 years old showed that once per week 75% of them eat at food courts, fast food restaurants, or from hawkers [10]. The food choices of children in the 5 and 6-year-old age group are highly influenced by their parents' choices and knowledge, but could also be influenced by the school environment [11]. Additionally, as children enter adolescent years (collective research reports this to be at around the age of 10 until 21 years old), there is an increasing trend for them to consume sugary and high-fat foods [12-14].

Children's physical activity habits impact their development in middle childhood (8 to 11 years old) as discussed previously. Physical activeness during middle childhood has shown to have health benefits. These include positive changes in the predisposition of fats, a positive impact on bone, muscle, and cardiologic health [15]. The benefits of physical activity during middle childhood has also shown to influence motor skills and health outcomes in adulthood [15, 16]. Physical activity among children has also been associated with high academic performance in school [17]. Physical activity has psychosocial benefits for the young because it can help to improve their self-confidence and social interaction.

Middle childhood refers to children aged between 8 to 12 years old, a period that is a bridge towards adolescence [18,19]. The experiences obtained during this period of middle childhood has the power to change, sustain, or modify any

difficulty or positive habits that children have developed during their pre-school years [20]. Additionally, habits or characteristics that children develop during middle childhood may be difficult to modify later, especially when they enter adolescent years [5]. This means that adaptation of habits during middle-childhood may become permanent as they enter adolescence and continue on to adulthood. Therefore, middle childhood is a critical period of development that has a large impact on shaping health and behaviour in later years.

Therefore, the aim of this research was to elicit opinions and attitudes towards healthy eating and physical activity in their schools and identify barriers mitigating against good nutrition and physical activity in the schools. There is currently no published research looking at the perceptions of Bruneians children on the nutrition and physical activities in the school settings, among the middle childhood age.

2. MATERIALS AND METHODS

Five focus groups of primary school students in years 4, 5, and 6 were conducted at 5 selected government primary schools in Brunei Darussalam. The schools were selected via purposeful sampling. The selection of schools represented a range of school types including rural school, water village school, school located in the residential houses, a school in the oil-rich district and a school located in a centre of a busy village area. The focus group session was between 30 minutes and 45 minutes duration and was divided into two separate sections: 'healthy eating' and 'physical activity'. All the focus group sessions were video recorded. A pilot was conducted in a single session to ensure the cohesiveness of the questions and drawing activities designed for the focus group. This included testing the uniformity of the participants in terms of age, gender, location and activity. Focus groups were selected because this method allows interaction between participants [21]. Drawing is used for triggering interview questions which have proven to be useful when interviewing children as a way of jumpstarting discussion [22,23]. Drawing activities also promote a relaxed atmosphere for the children and can also help to gain insight into the children's perspectives as well as provide structure and focus on the topics of discussion.

Each student was asked to draw one type of their favourite food and one type of drink that they want to bring to school, as well as two different kinds of sports equipment or playground games they wanted to have in their school. About 10 minutes were allocated for the students to complete their drawings. An option was also given for the students to just write the name of what they were drawing in case they didn't know how to draw it. The drawing session was followed by a group discussion based on what the students had drawn. Questions were asked to trigger discussion in terms of their opinions regarding their food choices and policy related to nutrition and physical activity for their school. The questions were developed by the researcher and with the help of literature research.

2.1 Topic: Healthy Eating

The focus group participants shared their drawings of dream lunch box or foods brought from home containing their favorite foods and drink. These are the types of foods that they like to have during their lunch break. The discussion was then guided by the Focus Group Guide.

1. *Why do you choose to bring these foods and drinks to school?*
2. *Who influence you to like this food and drinks?*
3. *Which of this food and drink are considered healthy?*
4. *Which of this food and drink are considered not healthy?*
5. *Is it important to eat healthy food and drinks? Why?*
6. *What do you prefer most, to buy food from school canteen or bring food from home?*
7. *What do you normally buy from the school canteen and why?*
8. *Do you think the food and drink sold at the canteen are healthy? Why*
9. *Do you also buy food and drink at other places? Other than the school canteen? If yes, where? What do you buy? Do you think they are healthy?*
10. *How can you be a good role model for healthy eating to your friends?*
11. *Have teachers in the school been a good role model for healthy eating in your school, yes or no? How?*
12. *Do you know any activity related to healthy eating that you like in your school?*

2.2 Topic: Physical Activity

The focus group participants then showed another piece of their drawing that showed their dream playground or play equipment the children's want to see in their school area.

1. *Why do you choose to draw this equipment?*
2. *If you have it, would you play it every day during break time especially?*
3. *What factor encourages you to do physical activity in the school?*
4. *What causes you not to do physical activity in the school area?*
5. *Do you think physical activity is important to children and why?*
6. *What do you normally do during break time after you finish eating your food and drinks? What sort of games do you play?*
7. *When you were playing, do you like it when teachers are around to see you play?*
8. *Do the teachers in the school encourage you to do exercise in the school area? Have they been a good role model?*
9. *When you come to school, do you walk or by car?*
10. *Would you be willing to walk to school? Will your parents allow it?*
11. *Would you be willing to cycle to school? But do you think it is safe to cycle to come to the school and why?*

Selection of students for this study was based on the following criteria:

- Age: middle childhood (8 to 11 years old), Year 4 to 6 from government primary school in Brunei
- Sex: both males and females
- Nationality: All included except permanent residents (because their social or dietary norms may be different from Bruneian children).

Responses were transcribed verbatim into a word document and names were removed to ensure confidentiality and anonymity. Transcribed data were transferred into QSR NVivo 11 to conduct the data analysis [24]. Thematic analysis was used to analyse the collected data. The thematic analysis applies a rigorous process to identify patterns of meaning that exist in a qualitative dataset [25]. This study followed the broad guidelines outlined by Braun and Clarke: data familiarisation; data coding; and

theme development and revision. Following close reading and re-reading of the data, initial categories and sub-categories were identified from the raw data. From those categories, broader themes were identified and refined. Patterns, differences and similarities among the groups of stakeholders were identified and a tree diagram was produced to assist in the interpretation of data. The first few transcriptions were analysed independently by another researcher, who was also involved in later stages of analysis and final interpretation of the data. This was an important step in enhancing rigour, consistency and trustworthiness of the findings [26].

3. RESULTS AND DISCUSSION

Thematic analysis of the focus group discussions with children produced the following three themes:

- *Healthy eating and physical activity are important for a healthy and strong body free of disease*
- *Unhealthy foods make us fat, cause diabetes and are bad for teeth*
- *Physical activity are mainly related to playing together in groups*

'Healthy eating and physical activity are important for a healthy and strong body free of disease'

The students in all of the groups agreed, when asked, that healthy eating is important for children. The students understood the biomedical rationale for the promotion of healthy eating in children. Healthy eating was perceived as important for three reasons: in order to get sufficient nutrients, for body growth and development and to help prevent harmful diseases. The students believed that healthy eating is important to get enough nourishment and described this as 'to get vitamins', 'to get proteins', 'get carbohydrates' and to obtain 'calcium for healthy bones'. Students also linked healthy eating to body growth and development, saying that it was important for 'energy', 'strong body', 'better life', 'to be strong', 'for brain', 'for active', 'study', 'to make us tall', 'feel fresh', 'for thinking', 'for remembering' and 'to stay happy'. Apart from that, children believed that healthy eating was important to prevent diseases, as shown in their responses: 'to prevent diseases', 'not to get fat', 'to prevent cholesterol' 'too much salt, we get pressure' (blood pressure). One

particular student's comment, 'When we eat healthy, at 45 years, we don't have any diseases like sugar, (blood) pressure' was triggered by her own father's diagnosis with diabetes.

Majority of the students also regarded physical activity as very important for children's health and well-being. The main reasons given were because it 'makes us healthy', 'for energy', 'feels happy after sports', 'prevent diseases', 'release stress' and 'healthy mind'. In many of the focus groups, the students also related physical activity to weight loss and maintenance. Some of the responses in relation to this were 'for the slim body', 'build muscles' and 'no weight gain'. Students in one group agreed that physical activity helps to improve their immune system so that they do not get 'sick easily'. The students did point out that the safety factor sometimes discourages them from doing physical activity during free times in the school. Some of the students thought that 'it's dangerous to play tag', they 'might fall down', and the ground might be 'slippery'. The most common reason that discouraged them from engaging in free physical play was that they are scared that their 'teacher get angry', mainly due to safety issues.

'Unhealthy foods make us fat, cause diabetes and are bad for teeth'

The term 'healthy food' was associated with rice, Milo TM, grapes, milk, fruit, vegetables and to a lesser extent less oil, salad, bread, soya bean and a type of soft drink called 100 plus. In some of the groups, nasi campur (chicken rice) was also mentioned as a healthy food because 'it has rice' and it has 'chicken for proteins and carbohydrates'. One of the groups had a minor debate on whether cookies were considered healthy. In terms of unhealthy foods, the groups linked it to unhealthy preparation methods and taste. Students in the majority of the groups associated unhealthy eating with foods that were oily, fried, contained too much sugar and were sweet to taste. To a much lesser extent, some students also mentioned food that contain too much salt was an attribute of unhealthy food. One of the groups also mentioned fast food was unhealthy food and drink. The students also understood the concept that an unhealthy diet may lead to unhealthy weight gain and to the development of some diseases. Some of the comments made regarding unhealthy food were that they 'make us fat', 'cause diabetes' and were 'bad for teeth'. The children's views regarding food and health were expressed in biomedical

terms, with an emphasis on food as carriers of nutrients.

'Physical activity mainly related to playing together in groups'

The main factor that motivates students to do physical activity in the school is having fun when they are 'playing together in a group.' Some of the respondents stated that they never feel shy about playing sport in the school compound because they play together with friends. All of the students have a break or recess time for about 30 minutes during school hours. Questions were asked relating to whether they did any sort of physical activity during those free periods. One of the main games played by students in most of the groups was tag, even though some of them knew that it may not be safe due to slippery and cemented grounds. In one of the schools, the students played a traditional Canadian game called 'gutter board' during their recess time which the students really enjoyed. There were mixed feelings regarding bringing their own sports equipment to school to play with during recess time. Some students, especially girls, thought that they might not be allowed to bring their own equipment. Girls mainly stay in their classroom to talk and have their meals together during recess time.

Many of the students had no choice but to come to school by car because they lived quite far away from the school. But some commented that they would love to walk together with friends to school if they lived nearby and there were appropriate paths that they could use. The students were aware of some safety issues regarding fast cars and the risk of attacks by animals, such as dogs, snakes and even monkeys. Some commented that they would love to cycle with friends to school if they lived nearby and there were appropriate cycling paths that they could use safely. Students in one of the groups pointed out that its 'too hot' to cycle to school and they also worry that their bicycles might get stolen, mainly due to no secure place to keep their bikes. Due to 'fast drivers' students in one of the groups still, think it is not safe to cycle even though there is a pathway available. One of the students, who had been to a western country for a holiday, had seen an underground cycling path and she thought this would encourage her to cycle to school.

Previous studies have shown that the availability and accessibility of sports facilities in school

settings have a positive impact on the children's physical activity habits [27,28]. Physical activity during recess periods has also been previously reported as an opportunity to cover about 5% to 40% of daily physical activity needs among children [29,30]. In this research, it was found that most of the schools had inadequate sports facilities and were without suitable play areas. In most cases, the sports equipment and facilities were provided to the schools by the Brunei Government. However, poor maintenance has led to prolonged damage to the sports equipment, rendering it unusable. Based on my findings, some efforts have been demonstrated by the schools to prepare special play areas for students to use, particularly during recess. Studies have shown that such efforts help to increase the level of physical activity among students [31]. Despite this effort, safety is a problem due to uneven and cemented grounds, thus play requires supervision throughout the recess period. There are also some useful strategies that can promote safety for students walking or cycling to school. For example, the provision of proper pedestrian and bike paths which connect the school to the housing areas. Other improvements include providing patrolled (traffic police) pedestrian crossings and strengthening road safety rules around the school area, particularly warning drivers to slow down and imposing maximum penalties.

4. CONCLUSION

Therefore, from the perspective of the students, they have been able to identify the positive outcomes of healthy eating on their health. The students seemed to understand these concepts because they have learnt them in their curriculum as part of the primary school science subjects. However, there were some inaccurate perceptions among the children in terms of food and drinks that they considered healthy and not healthy.

The overall impression is that children will readily and confidently volunteer information about food and physical activity in terms of their impact on health and wellbeing, reflecting the emphasis placed on these topics in the primary school curriculum. The children have a good academic understanding of the detrimental effect of poor diet and inactivity on physical health, but, without a supportive environment, children are faced with a significant barrier in translating their knowledge into action. The students were keen to do more fun activities such as sports activities in the

school but were hindered by the availability of time, equipment and safety within the school compound.

CONSENT

All authors declare that written informed consent was obtained from all of the participants.

ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki. ethical approval was obtained from The University of Queensland Human Ethics Committee (Project code: 2012000915). Approval was obtained from the main gatekeeper, the Director of School, Ministry of Education and Ministry of Health, Brunei.

ACKNOWLEDGEMENT

The authors wish to thank the MOH and MOE of Brunei Darussalam and the primary schools, for the permission to conduct the research. The research was part of a PhD study of SRA at the University of Queensland (32).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle3.com/review-history/47977>